

**CMR ENGINEERING COLLEGE: : HYDERABAD**  
**UGC AUTONOMOUS**

**III-B.TECH-II-Semester End Examinations (Supply) - June- 2025**

**ANTENNAS AND WAVE PROPAGATION**  
**(ECE)**

**[Time: 3 Hours]**

**[Max. Marks: 70]**

**Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

**PART-A**

**(20 Marks)**

1. a) Define Radiation Intensity. [2M]
- b) What is the directivity of the antenna? [2M]
- c) List out the salient features of antenna array. [2M]
- d) Distinguish between Broad Side Array and End Fire Array. [2M]
- e) What are the parameters to be considered for the design of a Helical antenna? [2M]
- f) Why Folded Dipole antenna is used in Yagi-Uda antenna? [2M]
- g) Classify the types of feeding structures used for Microstrip Patch Antenna. [2M]
- h) What are the primary and secondary antennas in parabolic reflectors? Give examples. [2M]
- i) Mention the uses of ground wave propagation. [2M]
- j) Calculate the maximum distance that can be covered by a space wave, when the antenna heights are 60 m and 120 m. [2M]

**PART-B**

**(50 Marks)**

2. Define radiation resistance. Derive the Expression for power radiated and find the radiation resistance of Hertzian dipole antenna. [10M]
- OR**
3. Explain about Half Wave Dipole Antenna. [10M]
4. Derive the expression for maxima, minima and beam width of a Broad Side Array. [10M]
- OR**
5. What is an antenna array? What are the types of antenna arrays, for each type explain with array diagram and radiation pattern. [10M]
6. Draw and explain the function of Helical antenna and various modes of radiation. Write its applications. [10M]
- OR**
7. Explain the radiation mechanism and features of Microwave Horn antenna with diagram [10M]
8. With necessary illustrations explain the radiation characteristics of Microstrip antenna and mention its applications. [10M]
- OR**
9. Discuss the special features of parabolic reflector antenna and explain different type of feed methods with neat diagram. [10M]

10. Explain characteristics of ground wave propagation and obtain expression for field strength. [10M]

**OR**

11. Explain the following: [10M]
- (i) Maximum Usable Frequency (MUF)
  - (ii) Attenuation characteristics for ground wave propagation

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